**Solubility of solids in solutions with a common ion**

**1)** A sample of seawater has a chloride ion concentration of 0.440 mol L–1.

Determine whether a precipitate of lead(II) chloride will form when a 2.00 g sample of lead(II) nitrate is added to

500 mL of the seawater. *K*s(PbCl2) = 1.70 × 10–5 *M*(Pb(NO3)2) = 331 g mol–1

**2)** Determine whether a precipitate of iron(III) hydroxide, Fe(OH)3, will form when Fe(NO3)3 is dissolved

in water. [Fe(NO3)3] = 1.05 × 10–4 mol L–1. Assume the pH of the water is 7. *K*s(Fe(OH)3) = 2.00 × 10–39

**3)** Discuss how the solubility of Ag2CrO4 will change if it is dissolved in 0.1 mol L–1 K2CrO4

*No calculations**are necessary.*

**4)** Sea water contains many dissolved salts. The chloride ion concentration in a sample of sea water is 0.440

mol L–1. Determine whether a precipitate of lead(II)chloride will form when a 1.00 g sample of lead(II)

nitrate is added to 500 mL of the sea water. *Your answer must be clearly justified*.

*M*(Pb(NO3)2) = 331 g mol–1

**5)** Sea-water contains appreciable amounts of ions other than Na+ and Cl–. Evaporating the sea-water to dryness would produce a mixture of salts including NaCl. However, precipitation of NaCl occurs if concentrated hydrochloric acid is added to a saturated NaCl solution. Explain why this precipitation occurs.

**6)** Fluoridation of a water supply produces a fluoride concentration of approximately 5 x 10–5 mol L–1.

Will calcium fluoride (CaF2) precipitate in a hard water supply where the concentration of calcium ions is

2 x 10–4 mol L–1? *Ks* (CaF2)= 3.2 x 10–11

© 2015 <http://www.chemicalminds.wikispaces.com>

NCEA questions and answers reproduced with permission from NZQA